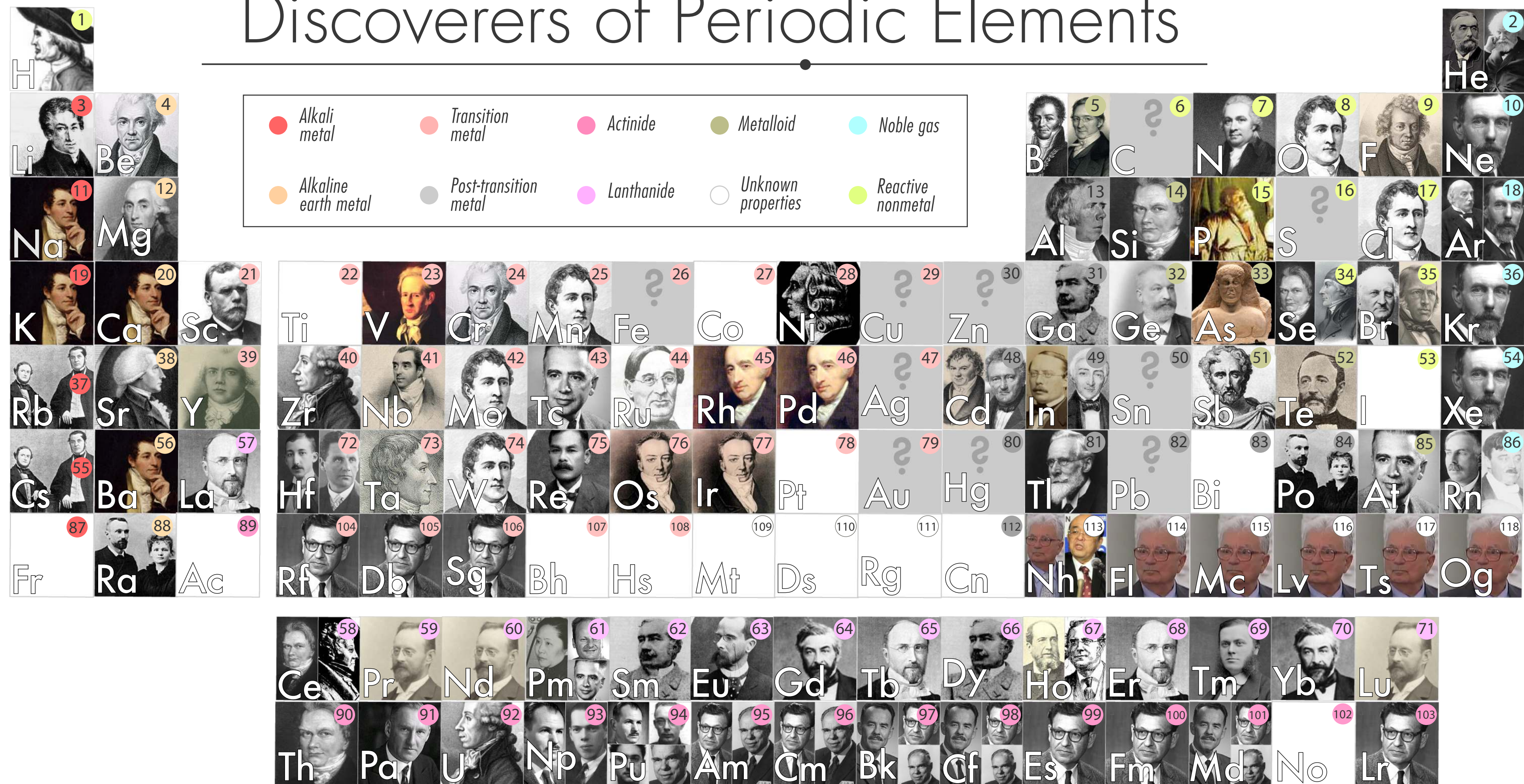


# Discoverers of Periodic Elements



- 1 Henry Cavendish
- 2 Pierre Janssen and Norman Lockyer
- 3 Johan August Arfwedson
- 4 Louis Nicolas Vauquelin
- 5 Joseph Louis Gay-Lussac and Louis Jacques Thénard
- 6 Unknown
- 7 Daniel Rutherford
- 8 Carl Wilhelm Scheele
- 9 André-Marie Ampère
- 10 William Ramsey and Morris William Travers
- 11 Sir Humphry Davy
- 12 Joseph Black
- 13 Hans Christian Ørsted
- 14 Jöns Jacob Berzelius
- 15 Hennig Brand
- 16 Unknown
- 17 Carl Wilhelm Scheele
- 18 John William Strutt and William Ramsay
- 19 Sir Humphry Davy
- 20 Sir Humphry Davy
- 21 Lars Fredrik Nilson
- 22 William Gregor
- 23 Andrés Manuel del Río Fernández
- 24 Louis Nicolas Vauquelin
- 25 Carl Wilhelm Scheele
- 26 Unknown
- 27 Georg Brandt
- 28 Axel Fredrik Cronstedt
- 29 Unknown

- 30 Unknown
- 31 Paul-Émile Lecoq de Boisbaudran
- 32 Clemens Alexander Winkler
- 33 Zosimos of Panopolis
- 34 Jöns Jacob Berzelius and Johan Gottlieb Gahn
- 35 Carl Jacob Löwig and Antoine Jérôme Balard
- 36 William Ramsey and Morris William Travers
- 37 Robert Wilhelm Eberhard Bunsen and Gustav Kirchhoff
- 38 William Cruickshank
- 39 Johan Gadolin
- 40 Martin Heinrich Klaproth
- 41 Charles Hatchett
- 42 Carl Wilhelm Scheele
- 43 Emilio Segrè and Carlo Perrier
- 44 Karl Ernst Claus
- 45 William Hyde Wollaston
- 46 William Hyde Wollaston
- 47 Unknown
- 48 Karl Samuel Leberecht Hermann, Friedrich Stromeyer, and Johann Christoff Heinrich Roloff
- 49 Ferdinand Reich and Hieronymus Theodor Richter
- 50 Unknown
- 51 Pliny the Elder
- 52 Franz-Joseph Müller von Reichenstein
- 53 Bernard Courtois
- 54 William Ramsey and Morris William Travers
- 55 Robert Wilhelm Eberhard Bunsen and Gustav Kirchhoff

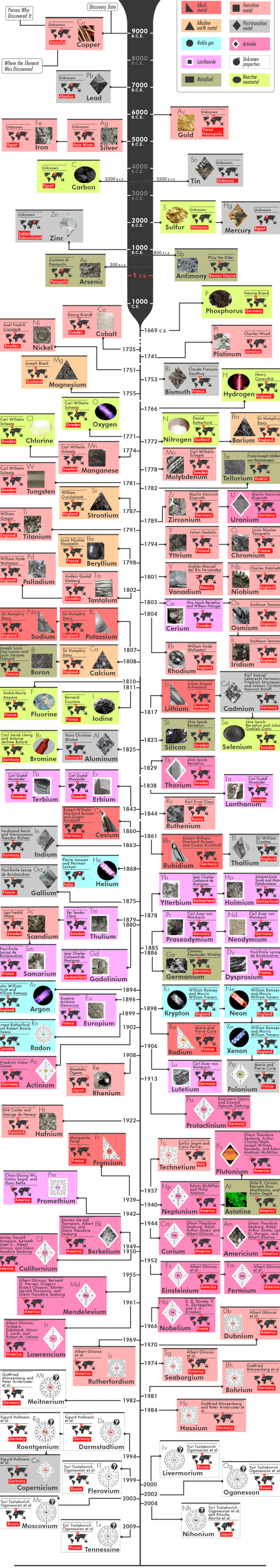
- 56 Sir Humphry Davy
- 57 Carl Gustaf Mosander
- 58 Jöns Jacob Berzelius and Wilhem Hisinger
- 59 Carl Auer von Welsbach
- 60 Carl Auer von Welsbach
- 61 Chien-Shiung Wu, Emilio Segrè, and Hans Bethe
- 62 Paul-Émile Lecoq de Boisbaudran
- 63 Eugène-Anatole Demarçay
- 64 Jean Charles Galissard de Marignac
- 65 Carl Gustaf Mosander
- 66 Paul-Émile Lecoq de Boisbaudran
- 67 Jacques-Louis Soret and Marc Delafontaine
- 68 Carl Gustaf Mosander
- 69 Per Teodor Cleve
- 70 Jean Charles Galissard de Marignac
- 71 Carl Auer von Welsbach
- 72 Dirk Coster and George de Hevesy
- 73 Anders Gustaf Ekeberg
- 74 Carl Wilhelm Scheele
- 75 Masataka Ogawa
- 76 Smithson Tennant
- 77 Smithson Tennant
- 78 Charles Wood
- 79 Unknown

- 80 Unknown
- 81 Sir William Crookes
- 82 Unknown
- 83 Claude François Geoffroy
- 84 Marie and Pierre Curie
- 85 Dale R. Corson, Kenneth Ross MacKenzie, and Emilio Segrè
- 86 Ernest Rutherford and Robert Bowie Owens
- 87 Marguerite Perey
- 88 Marie and Pierre Curie
- 89 Friedrich Oskar Giese
- 90 Jöns Jacob Berzelius
- 91 Kazimierz Fajans and Oswald Helmuth Göhring
- 92 Martin Heinrich Klaproth
- 93 Edwin McMillan and Philip Abelson
- 94 Glenn Theodore Seaborg, Arthur Charles Wahl, Joseph William Kennedy, and Edwin Mattison McMillan
- 95 Glenn Theodore Seaborg, Ralph Arthur James, Leon O. Morgan, and Albert Ghiorso
- 96 Glenn Theodore Seaborg, Ralph Arthur James, and Albert Ghiorso
- 97 Stanley Gerald Thompson, Albert Ghiorso, and Glenn Theodore Seaborg
- 98 Stanley Gerald Thompson, Kenneth Street Jr., Albert Ghiorso, and Glenn Theodore Seaborg

- 99 Albert Ghiorso et al.
- 100 Albert Ghiorso et al.
- 101 Albert Ghiorso, Bernard G. Harvey, Gregory Robert Choppin, Stanley Gerald Thompson, and Glenn Theodore Seaborg
- 102 E. D. Donets, V. A. Shchegolev, and V. A. Ermakov
- 103 Albert Ghiorso, Torbjørn Sikkeland, Almon E. Larsh, and Robert M. Latimer
- 104 Albert Ghiorso et al.
- 105 Albert Ghiorso et al.
- 106 Albert Ghiorso et al.
- 107 Gottfried Münzenberg et al.
- 108 Gottfried Münzenberg and Peter Armbruster et al.
- 109 Gottfried Münzenberg and Peter Armbruster et al.
- 110 Sigurd Hofmann et al.
- 111 Sigurd Hofmann et al.
- 112 Sigurd Hofmann et al.
- 113 Yuri Tsolakovich Oganessian et al. and Kōsuke Morita et al.
- 114 Yuri Tsolakovich Oganessian et al.
- 115 Yuri Tsolakovich Oganessian et al.
- 116 Yuri Tsolakovich Oganessian et al.
- 117 Yuri Tsolakovich Oganessian et al.
- 118 Yuri Tsolakovich Oganessian et al.

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# When Elements Were Discovered



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# The Periodic Table Through History Who Charted the Elements?

Join us at the Periodic Table for a wonderful opportunity to get to know not only the names of, but also the faces behind, the 92 natural chemical elements that comprise our universe. Each of these elements has its own characteristic identity and its own unique history. Behind each of them are scientists, whose contributions to modern chemistry were founded on unflagging dedication, hard work and often on personal sacrifice.

The discovery of these elements and their layout in tabular form according to recurring trends are among the most striking scientific achievements of mankind. The result — the periodic table — pays eternal tribute to the creativity and conviction of the scientific spirit, to man's capacity to chart and grasp the unknown.

## Who Else Was Involved?

- ★ 1) L. C. Thénard, Sir H. Davy
- ★ 2) C. W. Scheele, H. Cavendish, J. Priestley
- ★ 3) J. Priestley
- ★ 4) M. W. Travers
- ★ 5) C. H. Oersted
- ★ 6) J. W. Lord Rayleigh
- ★ 7) C. Löwig
- ★ 8) M. W. Travers
- ★ 9) G. R. Kirchhoff
- ★ 10) J. Gadolin
- ★ 11) C. Berriar
- ★ 12) H. T. Richter
- ★ 13) M. H. Klaproth
- ★ 14) M. W. Travers
- ★ 15) G. R. Kirchhoff
- ★ 16) W. Hisinger, M. H. Klaproth
- ★ 17) L. E. Glendenin, C. D. Coryll
- ★ 18) P. Boisbaudran
- ★ 19) G. Urbain
- ★ 20) C. Auer v. Welsbach
- ★ 21) D. Coster
- ★ 22) W. Noddack
- ★ 23) D. R. Corson, K. R. Mackenzie
- ★ 24) O. H. Göring
- ★ 25) P. H. Abelson
- ★ 26) E. M. McMillan, A. C. Wahl, J. W. Kennedy

## Lanthanoids

Lanthanoids are also called "rare earth elements". They are not truly rare, but hard to isolate.

<b>Ce</b> Jens Jakob Berzelius (1779-1848)	<b>Pr</b> Carl Auer von Welsbach (1848-1938)	<b>Nd</b> Carl Auer von Welsbach (1848-1938)	<b>Pm</b> Jacob A. Marinsky (1915-1995)	<b>Sm</b> Paul Emile Lönng de Boisbaudran (1838-1916)	<b>Eu</b> Eugene-Anastole Demarçay (1834-1917)	<b>Gd</b> Jean Charles G. de Marignac (1846-1907)	<b>Tb</b> Carl Gustav Mosander (1797-1857)	<b>Dy</b> Paul Emile Lönng de Boisbaudran (1838-1916)	<b>Ho</b> Per Theodor Cleve (1839-1909)	<b>Er</b> Carl Gustav Mosander (1797-1857)	<b>Tm</b> Per Theodor Cleve (1839-1909)	<b>Yb</b> Jean Charles G. de Marignac (1846-1907)	<b>Lu</b> Georges Urbain (1868-1942)
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## Actinoids

All actinoids are radioactive because they are unstable. The elements following uranium are not found in nature but were artificially prepared.

<b>Th</b> Jens Jakob Berzelius (1779-1848)	<b>Pa</b> Kasimir Fajans (1882-1975)	<b>U</b> Martin Heinrich Klaproth (1774-1822)	<b>Np</b> Edwin Mattison McMillan (1917-1991)	<b>Pu</b> Glenn Theodore Seaborg (1912-1999)	<b>Am</b> Glenn Theodore Seaborg (1912-1999)	<b>Cm</b> Glenn Theodore Seaborg (1912-1999)	<b>Bk</b> Glenn Theodore Seaborg (1912-1999)	<b>Cf</b> Glenn Theodore Seaborg (1912-1999)	<b>Es</b> Albert Ghiorso (1917-1990)	<b>Fm</b> Albert Ghiorso (1917-1990)	<b>Md</b> Glenn Theodore Seaborg (1912-1999)	<b>No</b> Albert Ghiorso (1917-1990)	<b>Lr</b> Albert Ghiorso (1917-1990)
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Julius L. Meyer (1830-1895) arranged the elements according to the size of their atoms in 1869.

Dimitri I. Mendeleev (1834-1907) discovered it was possible to lay out the elements according to the recurring trends in their chemical properties.

## Modern Knowledge of the Atom — Who Do We Have to Thank?

"There is nothing in nature that we know so well as the atom — and yet why it exists is still a mystery."

<b>Idea of the atom</b> Democritus of Abdera (460-370 BC)	<b>Atomic model</b> John Dalton (1766-1844)	<b>Atomic volume</b> Lorenzo Angeli (1778-1846)	<b>X-rays</b> Wilhelm C. Röntgen (1845-1923)	<b>Radioactivity</b> Antoine H. Becquerel (1852-1908)	<b>Electrons</b> Sir Joseph J. Thomson (1854-1940)	<b>Quantum physics</b> Max K. E. L. Planck (1858-1947)	<b>Isotopes</b> Frederick Soddy (1867-1950)	<b>Central nucleus</b> Sir Ernest Rutherford (1871-1937)	<b>Planetary model</b> Niels H. B. Bohr (1879-1962)	<b>Pauli principle</b> Wolfgang Pauli (1900-1958)	<b>Quantum mechanics</b> Werner K. Heisenberg (1901-1958)	<b>Wave mechanics</b> Erwin Schrödinger (1887-1951)	<b>Statistical quantum mechanics</b> Max Born (1882-1970)
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## More About the Elements and Their Discovery:

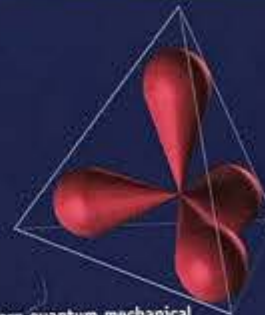
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P. Engskog  
ISBN: 978-3-527-30966-4
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E. Fluck, K. G. Neumann  
ISBN: 978-3-527-32082-0 (poster)  
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John Dalton's depiction of the atom as a simple sphere



Planetary model of the carbon atom according to Niels Bohr



Modern quantum mechanical representation of the carbon atom



Idea & concept:  
Prof. Dr. H.-J. Quadbeck-Seeger  
Artwork & design:  
Günther Schulz

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# NAMES OF SCIENTISTS ASSOCIATED WITH DISCOVERIES OF ELEMENTS OF PERIODIC TABLE

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Department of Chemistry, York University  
4700 Keele Street, Toronto, ONTARIO M3J 1P3, CANADA

For suggestions, corrections, additional information, and comments please send e-mails to [jandraos@yorku.ca](mailto:jandraos@yorku.ca)

<http://www.chem.yorku.ca/NAMED/>

Z, Element	Symbol	Discoverer	Dates	Nationality	Place and Date of Discovery
1. Hydrogen	H	Cavendish, Henry	1731 - 1810	British (b. Nice, France)	1766 London, England
2. Helium	He	Janssen, Pierre Jules Cesar	1824 - 1907	French (b. Paris, France)	1868
		Ramsay, Sir William	1852 - 1916	Scottish (b. Glasgow, Scotland)	1895 London, England
3. Lithium	Li	Arfvedson, Johann August	1792 - 1841	Swedish (b. Skagerholms-Bruk, Skaraborgs-Län, Sweden)	1817/1818 Stockholm, Sweden

4. Beryllium	<b>Be</b>	Vauquelin, Louis Nicolas	1763 - 1829	French (b. Saint-André d'Héberôt, Calvados, France)	1797 Paris, France
5. Boron	<b>B</b>	Gay-Lussac, Joseph Louis	1778 - 1850	French (b. St. Léonard, Haute Vienne, France)	1808 Paris, France London, England
		Thénard, Louis Jacques	1777 - 1857	French (b. Louptière, France)	
		Davy, Sir Humphry	1778 - 1829	British (b. Penzance, Cornwall, England)	
6. Carbon	<b>C</b>	N/A	N/A	N/A	pre-history
7. Nitrogen	<b>N</b>	Rutherford, Daniel	1749 - 1819	Scottish (b. Edinburgh, Scotland)	1772 Edinburgh, Scotland
8. Oxygen	<b>O</b>	Priestley, Joseph	1733 - 1804	British (b. Fieldhead, near Leeds, England)	1774 Leeds, England
		Scheele, Carl Wilhelm	1742 - 1786	Swedish (b. Stralsund, Pomerania, now in Germany)	Uppsala, Sweden
9. Fluorine	<b>F</b>	Moissan, Henri	1852 - 1907	French (b. Paris, France)	1886 Paris, France

10. Neon	<b>Ne</b>	Ramsay, Sir William Travers, Morris William	1852 - 1916 1872 - 1961	Scottish (b. Glasgow, Scotland) British (b. Kensington, London, England)	1898 London, England
11. Sodium	<b>Na</b>	Davy, Sir Humphry	1778 - 1829	British (b. Penzance, Cornwall, England)	1807 London, England
12. Magnesium	<b>Mg</b>	Black, Joseph	1728 - 1799	Scottish (b. Bordeaux, France)	1755 Edinburgh, Scotland
13. Aluminum	<b>Al</b>	Öersted, Hans Christian	1777 - 1851	Danish (b. Rudkøbing, Denmark)	1825 Copenhagen, Denmark
14. Silicon	<b>Si</b>	Berzelius, Jöns Jakob	1779 - 1848	Swedish (b. Väversunda, Östergötland, Sweden)	1824 Stockholm, Sweden
15. Phosphorus	<b>P</b>	Brand, Hennig	<i>fl.</i> 1670	German (b. Hamburg, Germany)	1669 Hamburg, Germany
16. Sulfur	<b>S</b>	N/A	N/A	N/A	pre-history
17. Chlorine	<b>Cl</b>	Scheele, Carl Wilhelm	1742 - 1786	Swedish (b. Stralsund, Pomerania, now in Germany)	1774 Uppsala, Sweden

18. Argon	<b>Ar</b>	Rayleigh, Lord John William Strutt, 3rd Baron	1842 - 1919	British (b. near Maldon, Essex, England)	1894 London, England Bristol, England
		Ramsay, Sir William	1852 - 1916	Scottish (b. Glasgow, Scotland)	
19. Potassium	<b>K</b>	Davy, Sir Humphry	1778 - 1829	British (b. Penzance, Cornwall, England)	1807 London, England
20. Calcium	<b>Ca</b>	Davy, Sir Humphry	1778 - 1829	British (b. Penzance, Cornwall, England)	1808 London, England
21. Scandium	<b>Sc</b>	Nilson, Lars Frederick	1840 - 1899	Swedish (b. Östergötland, Sweden)	1879 Uppsala, Sweden
22. Titanium	<b>Ti</b>	Gregor, Rev. William	1761 - 1817	British (b. Trewarthenick, Cornwall, England)	1791 Creed, Cornwall, England
		Klaproth, Martin Heinrich	1743 - 1817	German (b. Wernigerode, Germany)	1795 Berlin, Germany
23. Vanadium	<b>V</b>	del Rio, Andrés Manuel	1764 - 1849	Spanish (b. Madrid, Spain)	1801 Mexico City, Mexico
24. Chromium	<b>Cr</b>	Vauquelin, Louis Nicolas	1763 - 1829	French (b. Saint-André d'Héberôt, Calvados, France)	1797 Paris, France

25. Manganese	<b>Mn</b>	Gahn, Johan Gottlieb	1745 - 1818	Swedish (b. Voxna, Gävleborg, Sweden)	1774 Stockholm, Sweden
26. Iron	<b>Fe</b>	N/A	N/A	N/A	c. 2500 BC
27. Cobalt	<b>Co</b>	Brandt, Georg	1694 - 1768	Swedish (b. Riddarhytta, Sweden)	1735 Stockholm, Sweden
28. Nickel	<b>Ni</b>	Cronstedt, Axel Frederik, Baron	1722 - 1765	Swedish (b. Södermanland, Sweden)	1751 Stockholm, Sweden
29. Copper	<b>Cu</b>	N/A	N/A	N/A	c. 5000 BC
30. Zinc	<b>Zn</b>	N/A	N/A	N/A	pre 1500; 1374
31. Gallium	<b>Ga</b>	de Boisbaudran, Paul Émile Lecoq	1838 - 1912	French (b. Cognac, Charente, France)	1875 Paris, France
32. Germanium	<b>Ge</b>	Winkler, Clemens Alexander	1838 - 1904	German (b. Freiberg, Germany)	1886 Freiberg, Germany
33. Arsenic	<b>As</b>	Magnus, Albertus St. (Count von Bollstädt)	1193 - 1280	German (b. Lauingen, Germany)	c. 1250 Germany
34. Selenium	<b>Se</b>	Berzelius, Jöns Jakob	1779 - 1848	Swedish (b. Väversunda, Östergötland, Sweden)	1817 Stockholm, Sweden
35. Bromine	<b>Br</b>	Balard, Antoine Jérôme	1802 - 1876	French (b. Montpellier, Hérault, France)	1826 Montpellier, France
		Löwig, Carl	1803 - 1890	German (b. Kreuznach, Germany)	Heidelberg, Germany



36. Krypton	<b>Kr</b>	Ramsay, Sir William	1852 - 1916	Scottish (b. Glasgow, Scotland)	1898 London, England
		Travers, Morris William	1872 - 1961	British (b. Kensington, London, England)	
37. Rubidium	<b>Rb</b>	Bunsen, Robert Wilhelm	1811 - 1899	German (b. Göttingen, Germany)	1861 Heidelberg, Germany
		Kirchhoff, Gustav Robert	1824 - 1887	German (b. Königsberg, Prussia (now Kaliningrad, Russia)))	
38. Strontium	<b>Sr</b>	Hope, Thomas Charles	1766 - 1844	Scottish (b. Edinburgh, Scotland)	1792 Strontian, Scotland
		Crawford, Adair	1748 - 1795	Scottish (b. Antrim, Ireland)	1808 Edinburgh, Scotland
39. Yttrium	<b>Y</b>	Gadolin, Johann	1760 - 1852	Finnish (b. Åbo, Finland)	1794 Åbo, Finland
40. Zirconium	<b>Zr</b>	Klaproth, Martin Heinrich	1743 - 1817	German (b. Wernigerode, Germany)	1789 Berlin, Germany
41. Niobium	<b>Nb</b>	Hatchett, Charles	1765 - 1847	British (b. London, England)	1801 London, England
42. Molybdenum	<b>Mo</b>	Hjelm, Peter Jacob	1746 - 1813	Swedish (b. Sunnerbo, Sweden)	1781 Uppsala, Sweden

43. Technetium	<b>Tc</b>	Noddack, Walter	1893 - 1960	German (b. Bamberg, Germany)	1925 Berlin, Germany
		Perrier, Carlo	1886 - 1948	Italian (b. ?)	
		Segré, Emilio Gino	1905 - 1989	Italian-American (b. Tivoli, near Rome, Italy)	1937 Palermo, Sicily, Italy
44. Ruthenium	<b>Ru</b>	Sniadecki, Jedrzej Andrzej	1768 - 1838	Polish (b. ?)	1808 Vilno, Poland
		Osann, Gottfried Wilhelm	1797 - 1866	German (b. Weimar, Germany)	1828
		Claus, Carl Ernst (Klaus, Karl Karlovich)	1796 - 1864	Estonian (b. Dorpat (Tartu))	1844
45. Rhodium	<b>Rh</b>	Wollaston, William Hyde	1766- 1828	British (b. East Dereham, Norfolk, England)	1803 London, England
46. Palladium	<b>Pd</b>	Wollaston, William Hyde	1766- 1828	British (b. East Dereham, Norfolk, England)	1803 London, England
47. Silver	<b>Ag</b>	N/A	N/A	N/A	c. 3000 BC

48. Cadmium	<b>Cd</b>	Stromeyer, Friedrich	1776 - 1835	German (b. Göttingen, Germany)	1817
		Davy, Sir Humphry	1778 - 1829	British (b. Penzance, Cornwall, England)	1817 London, England
49. Indium	<b>In</b>	Reich, Ferdinand	1799 - 1882	German (b. Bernburg, Germany)	1863 Freiberg, Germany
		Richter, Hieronymous Theodor	1824 - 1898	German (b. Dresden, Germany)	
50. Tin	<b>Sn</b>	N/A	N/A	N/A	c. 2100 BC
51. Antimony	<b>Sb</b>	N/A	N/A	N/A	c. 1600 BC
52. Tellurium	<b>Te</b>	Müller, Franz Joseph, Baron von Reichenstein	1740 - 1825	Austrian (b. Nagyszeben, Austria, now Rumania)	1782/3 Sibiu, Romania
53. Iodine	<b>I</b>	Courtois, Bernard	1777 - 1838	French (b. Dijon, France)	1811 Paris, France
54. Xenon	<b>Xe</b>	Ramsay, Sir William	1852 - 1916	Scottish (b. Glasgow, Scotland)	1898 London, England
		Travers, Morris William	1872 - 1961	British (b. Kensington, London, England)	

55. Cesium	<b>Cs</b>	Bunsen, Robert Wilhelm	1811 - 1899	German (b. Göttingen, Germany)	1860 Heidelberg, Germany
		Kirchhoff, Gustav Robert	1824 - 1887	German (b. Königsberg, Prussia (now Kaliningrad, Russia)))	
56. Barium	<b>Ba</b>	Davy, Sir Humphry	1778 - 1829	British (b. Penzance, Cornwall, England)	1808 London, England
57. Lanthanum	<b>La</b>	Mosander, Carl Gustav	1797 - 1858	Swedish (b. Kalmar, Sweden)	1839 Stockholm, Sweden
58. Cerium	<b>Ce</b>	Berzelius, Jöns Jakob	1779 - 1848	Swedish (b. Väversunda, Östergötland, Sweden)	1803 Västmanland, Sweden
		Hisinger, Wilhelm	1766 - 1852	Swedish (b. Skinnskatteberg, Västmanland, Sweden)	
59. Praseodymium	<b>Pr</b>	Auer, Karl, Freiherr von Welsbach	1858 - 1929	Austrian (b. Vienna, Austria)	1885 Vienna, Austria

60. Neodymium	<b>Nd</b>	Mosander, Carl	1797 - 1858	Swedish (b. Kalmar, Sweden)	1841 Stockholm, Sweden
		Auer, Karl, Freiherr von Welsbach	1858 - 1929	Austrian (b. Vienna, Austria)	1885 Vienna, Austria
61. Promethium	<b>Pm</b>	Marinsky, Jacob Akiba	1918 - 2005	American (b. Buffalo, New York, USA)	1945 Oak Ridge, USA
		Glendenin, Lawrence Elgin	1918 - 2008	American (b. Bay City, Michigan, USA)	
		Coryell, Charles DuBois	1912 - 1971		
62. Samarium	<b>Sm</b>	Delafontaine, Marc	1837 – 1911	Swiss (b. Céligny, Switzerland)	1878
		de Boisbaudran, Paul Émile Lecoq	1838 - 1912	French (b. Cognac, Charente, France)	1879 Paris, France
63. Europium	<b>Eu</b>	Demarçay, Eugène Anatole	1852 - 1904	French (b. Paris, France)	1896, 1901 Paris, France

64. Gadolinium	<b>Gd</b>	de Marignac, Jean Charles Galissard	1817 – 1894	Swiss (b. Geneva, Switzerland)	1886 Geneva, Switzerland
		de Boisbaudran, Paul Émile Lecoq	1838 - 1912	French (b. Cognac, Charente, France)	1886 Paris, France
65. Terbium	<b>Tb</b>	Mosander, Carl Gustav	1797 - 1858	Swedish (b. Kalmar, Sweden)	1843 Stockholm, Sweden
66. Dysprosium	<b>Dy</b>	Delafontaine, Marc	1837 – 1911	Swiss (b. Céligny, Switzerland)	1878
		de Boisbaudran, Paul Émile Lecoq	1838 - 1912	French (b. Cognac, Charente, France)	1886 Paris, France
67. Holmium	<b>Ho</b>	Cleve, Per Teodor	1840 - 1905	Swedish (b. Stockholm, Sweden)	1878 Uppsala, Sweden
		Delafontaine, Marc	1837 – 1911	Swiss (b. Céligny, Switzerland)	
		Soret, Jacques Louis	1827 - 1890	Swiss (b. Geneva, Switzerland)	Geneva, Switzerland
68. Erbium	<b>Er</b>	Mosander, Carl Gustav	1797 - 1858	Swedish (b. Kalmar, Sweden)	1842/3 Stockholm, Sweden
69. Thulium	<b>Tm</b>	Cleve, Per Teodor	1840 - 1905	Swedish (b. Stockholm, Sweden)	1879 Uppsala, Sweden

70. Ytterbium	<b>Yb</b>	de Marignac, Jean Charles Galissard	1817 - 1894	Swiss (b. Geneva, Switzerland)	1878 Geneva, Switzerland
71. Lutetium	<b>Lu</b>	Urbain, Georges  James, C.	1872 - 1938	French (b. Paris, France)	1907 Paris, France New Hampshire, USA
72. Hafnium	<b>Hf</b>	Urbain, Georges  Coster, Dirk  Hevesy, György Karl von	1872 - 1938  1889 - 1950  1885 - 1966	French (b. Paris, France)  Dutch (b. Amsterdam, Netherlands)  Hungarian-Swedish (b. Budapest, Hungary)	1911 Paris, France  1923 Copenhagen, Denmark
73. Tantalum	<b>Ta</b>	Ekeberg, Anders Gustaf	1767 - 1813	Swedish (b. Stockholm, Sweden)	1802 Uppsala, Sweden
74. Tungsten	<b>W</b>	D'Elhuyar, Don Juan José D'Elhuyar, Don Fausto	1755 - 1833	Spanish (b. Logroño, Spain)	1783 Vergara, Spain

75. Rhenium	<b>Re</b>	Noddack, Walter Karl Friedrich	1893 - 1960	German (b. Bamberg, Germany)	1925 Berlin, Germany
		Noddack, Ida Eva Tacke	1896 - 1978	German (b. Lackhausen, Germany)	
		Berg, Otto	1874 - 1939	German (b. ?)	
76. Osmium	<b>Os</b>	Tennant, Smithson	1761 - 1815	British (b. Selby, England)	1803 London, England
77. Iridium	<b>Ir</b>	Tennant, Smithson	1761 - 1815	British (b. Selby, England)	1803 London, England
78. Platinum	<b>Pt</b>	N/A	N/A	N/A	pre 1700
79. Gold	<b>Au</b>	N/A	N/A	N/A	c. 3000 BC
80. Mercury	<b>Hg</b>	N/A	N/A	N/A	c. 1500 BC
81. Thallium	<b>Tl</b>	Crookes, Sir William	1832 - 1919	British (b. London, England)	1861 London, England
82. Lead	<b>Pb</b>	N/A	N/A	N/A	c. 1000 BC
83. Bismuth	<b>Bi</b>	N/A	N/A	N/A	c. 1500
84. Polonium	<b>Po</b>	Curie, Marie	1867 - 1934	French (b. Warsaw, Poland)	1898 Paris, France



85. Astatine	<b>At</b>	Corson, Dale Raymond  Mackenzie, Kenneth Ross  Segrè, Emilio Gino	1914 -  1912 – 2002*  1905 - 1989	American (b. Pittsburg, Kansas, USA)  American (b. Portland, Oregon, USA)  Italian-American (b. Tivoli, near Rome, Italy)	1940 Berkeley, California, USA
86. Radon	<b>Rn</b>	Dorn, Friedrich Ernst	1848 - 1916	German (b. Guttstadt, Germany)	1900 Halle, Germany
87. Francium	<b>Fr</b>	Perey, Marguerite Catherine	1909 - 1975	French (b. Villemomble, France)	1939 Paris, France
88. Radium	<b>Ra</b>	Curie, Marie (Manya née Skłodowska) Curie, Pierre	1867 - 1934  1859 - 1906	French (b. Warsaw, Poland)  French (b. Paris, France)	1898 Paris, France
89. Actinium	<b>Ac</b>	Debièrne, André Louis	1874 - 1949	French (b. Paris, France)	1899 Paris, France
90. Thorium	<b>Th</b>	Berzelius, Jöns Jakob	1779 - 1848	Swedish (b. Väversunda, Östergötland, Sweden)	1815, 1828 Stockholm, Sweden

91. Protactinium	<b>Pa</b>	Hahn, Otto	1879 - 1968	German (b. Frankfurt, Germany)	1917 Berlin, Germany
		Meitner, Lise	1878 - 1968	Austrian-Swedish (b. Vienna, Austria)	
		Soddy, Frederick	1877 - 1956	British (b. Eastbourne, England)	
		Cranston, John A.	1925 - 1980	British (b. England)	
		Fleck, Sir Alexander, Baron	1889 - 1968	Scottish (b. Glasgow, Scotland)	
		Fajans, Kasimir	1887 - 1975	Polish (b. Warsaw, Poland)	
		Göhring, Otto H.			
92. Uranium	<b>U</b>	Klaproth, Martin Heinrich	1743 - 1817	German (b. Wernigerode, Germany)	1789 Berlin, Germany
93. Neptunium	<b>Np</b>	McMillan, Edwin M.	1907 - 1991	American (b. Redondo Beach, California, USA)	1940 Berkeley, California, USA
		Abelson, Philip Hauge	1913 - 2002*	American (b. Tacoma, Washington, USA)	

94. Plutonium	<b>Pu</b>	Seaborg, Glenn T. Wahl, Arthur Charles Kennedy, J.W.	1912 - 1999 1917 - ?	American (b. Ishpeming, Michigan, USA) American (b. Des Moines, Iowa, USA)	1940 Berkeley, California, USA
95. Americium	<b>Am</b>	Seaborg, Glenn T. James, Ralph Arthur Morgan, Leon Owen Ghiorso, Albert	1912 - 1999 1920 - 1919 - 1915 - 2010	American (b. Ishpeming, Michigan, USA) American (b. Salt Lake City, Utah, USA) American (b. Oklahoma City, Oklahoma, USA) American (b. Vallejo, California, USA)	1944 Chicago, Illinois, USA
96. Curium	<b>Cm</b>	Seaborg, Glenn T. James, R.A. Ghiorso, Albert	1912 - 1999 1915 - 2010	American (b. Ishpeming, Michigan, USA)  American (b. Vallejo, California, USA)	1944 Berkeley, California, USA
97. Berkelium	<b>Bk</b>	Thompson, S.G. Seaborg, Glenn T. Ghiorso, Albert	1912 - 1976 1912 - 1999 1915 - 2010	American (b. Ishpeming, Michigan, USA) American (b. Vallejo, California, USA)	1949 Berkeley, California, USA

98. Californium	<b>Cf</b>	Thompson, S.G. Seaborg, Glenn T. Ghiorso, Albert  Street, Jr., Kenneth	1912 - 1976 1912 - 1999  1915 - 2010	American American (b. Ishpeming, Michigan, USA) American (b. Vallejo, California, USA)	1950 Berkeley, California, USA
99. Einsteinium	<b>Es</b>	Choppin, Gregory Robert Thompson, Stanley Gerald Harvey, Bernard George Ghiorso, Albert	1927 - 2015  1912 - 1976  1919 - 2016  1915 - 2010	American (b. Eagle Lake, Texas, USA) American British-American (b. England) American (b. Vallejo, California, USA)	1952 Berkeley, California, USA
100. Fermium	<b>Fm</b>	Choppin, Gregory Robert Thompson, S.G. Harvey, B.G.  Ghiorso, Albert	1927 - 2015  1912 - 1976 1919 - 2016  1915 - 2010	American (b. Eagle Lake, Texas, USA) American British-American (b. England) American (b. Vallejo, California, USA)	1952 Berkeley, California, USA

101. Mendelevium	<b>Md</b>	Choppin, Gregory Robert  Thompson, S.G. Harvey, B.G. Ghiorso, Albert  Seaborg, Glenn T.	1927 - 2015  1912 - 1976  1915 - 2010  1912 - 1999	American (b. Eagle Lake, Texas, USA)  American  British (b. England) American (b. Vallejo, California, USA) American (b. Ishpeming, Michigan, USA)	1955 Berkeley, California, USA
102. Nobelium	<b>No</b>	Sikkeland, Torbjorn Walton, John Richard Ghiorso, Albert  Seaborg, Glenn T.	1923 - 2014  1923 -  1915 - 2010  1912 - 1999	Norwegian (b. Varteig, Norway) American (b. Chicago Heights, Illinois, USA) American (b. Vallejo, California, USA) American (b. Ishpeming, Michigan, USA)	1958 Berkeley, California, USA
103. Lawrencium	<b>Lr</b>	Larsh, Almon E. Sikkeland, Torbjorn  Ghiorso, Albert  Latimer, Robert M.	1929 -  1923- 2014  1915 - 2010  1934 -1998	American (b. California, USA)  Norwegian (b. Varteig, Norway)  American (b. Vallejo, California, USA) American (b. California, USA)	1961 Berkeley, California, USA

104. Rutherfordium	<b>Rf</b>	Flerov, G.N. Zvara, I.I. Ghiorso, Albert	1915 - 2010	Russian Russian American (b. Vallejo, California, USA)	1964 Dubna, Russia Berkeley, California, USA
105. Dubnium	<b>Db</b>	Flerov, G.N. Ghiorso, Albert	1915 - 2010	Russian American (b. Vallejo, California, USA)	1967 Dubna, Russia Berkeley, California, USA
106. Seaborgium	<b>Sg</b>	Ghiorso, Albert	1915 - 2010	American (b. Vallejo, California, USA)	1974 Berkeley, California, USA
107. Bohrium	<b>Bh</b>	Armbruster, Peter  Münzenberg, Gottfried	1935 -	German, b. Dachau, Germany	1981 Darmstadt, Germany
108. Hassium	<b>Hs</b>	Armbruster, Peter  Münzenberg, Gottfried	1935 -	German, b. Dachau, Germany	1984 Darmstadt, Germany
109. Meitnerium	<b>Mt</b>	Armbruster, Peter  Münzenberg, Gottfried	1935 -	German, b. Dachau, Germany	1982 Darmstadt, Germany

110. Ununnilium (Darmstadtium)	<b>Uun, Dm</b>	Armbruster, Peter Hofmann, S.	1935 -	German, b. Dachau, Germany	1994 Darmstadt, Germany
111. Ununonium (Roentgenium)	<b>Uuu</b>	Armbruster, Peter Hofmann, S.	1935 -	German, b. Dachau, Germany	1994 Darmstadt, Germany
112. Ununbium	<b>Uub</b>	Armbruster, Peter Hofmann, S.	1935 -	German, b. Dachau, Germany	1996 Darmstadt, Germany

\*Personal communication from Dr. Joel S. Leventhal, Emeritus Scientist, U.S. Geological Survey, November 28, 2005.

<b>DISCOVERERS OF ELEMENTS IN PERIODIC TABLE</b>			
<b>University</b>	<b>Scientists</b>	<b>Degree</b>	<b>Elements Discovered</b>
Berlin	Meitner, Lise	1922	Pa
Berlin	Noddack, Walter Karl Friedrich	1921	Re
Berlin/ Heidelberg	Löwig, Carl Jacob	1830?	Br
Cal Tech	Coryell, Charles Dubois	1935	Pm
Cambridge	Cavendish, Henry	1753 (no deg.)	H
Cambridge	Gregor, Rev. William	1780's	Ti
Cambridge	Rayleigh, Lord John William Strutt	1865	Ar
Cambridge	Tennant, Smithson	1796 (MD)	Os, Ir
Cambridge	Wollaston, William Hyde	1787 (MD)	Rh, Pd
Colegio de San Isidro	del Rio, Andrés Manuel	1781	V
Copenhagen	Öersted, Hans Christian	1799	Al
Dorpat	Claus, Carl Ernst	1839	Ru

(Tartu)	(Klaus, Karl Karlovich)		
Ecole Polytech.	Balard, Antoine Jérôme	1826(pharm)	Br
Ecole Polytech.	Courtois, Bernard	1801	I
Ecole Polytech.	Gay-Lussac, Joseph Louis	1800	B
Ecole Polytech.	Demarçay, Eugène Anatole	1880 (hon.)	Eu
Ecole Polytech.	Thénard, Louis Jacques	1790's (no deg.)	B
Ecole Polytech./ Mines	de Marignac, Jean Charles Galissard	1830's	Gd, Yb
Edinburgh	Black, Joseph	1754	Mg
Edinburgh	Priestley, Joseph	1767	O
Edinburgh	Rutherford, Daniel	1772 (MD)	N
England	Davy, Sir Humphry	no deg.	B, Na, K, Ca, Cd, Ba
England	Hatchett, Charles	no deg.	Nb
Freiberg	D'Elhuyar, Don Fausto	1770s	W
Freiberg	D'Elhuyar, Don Juan José	1770s	W
Freiberg	Richter, Hieronymous Theodor	1850s	In
Freiberg	Winkler, Clemens Alexander	1860's	Ge
Freiburg	Hevesy, György Karl von	1908	Hf
Geneva	Soret, Jaques Louis	1850s (no deg.)	Ho
Germany	Brand, Hennig	no deg.	P
Germany	Klaproth, Martin Heinrich	no deg.	U, Ti, Zr
Glasgow	Cranston, John Arnold	1921	Pa
Glasgow	Crawford, Adair	1780 (MD)	Sr
Glasgow	Fleck, Sir Alexander	1916	Pa
Goettingen	Bunsen, Robert Wilhelm	1833	Rb, Cs



Goettingen	Reich, Ferdinand	1819+	In
Heidelberg	Auer, Karl, Freiherr von Welsbach	1882	Pr, Nd
Heidelberg	Fajans, Kasimir	1909	Pa
Koenigsberg	Dorn, Friedrich Ernst	1871	Rn
Koenigsberg	Kirchhoff, Gustav Robert	1847	Rb, Cs
Leiden	Coster, Dirk	1922	Hf
Marburg	Hahn, Otto	1901	Pa
MIT	Glendenin, Lawrence Elgin	1949	Pm
MIT	Marinsky, Jacob A.	1949	Pm
Oxford	Harvey, Bernard George	1958	Es, Fm, Md
Oxford	Soddy, Frederick	1898 (BSc)	Pa
Padua	Magnus, Albertus St.	1220s	As
Paris	de Boisbaudran, Paul Émile Lecoq	no deg.	Ga, Sm, Dy
Paris	Moissan, Ferdinand Frederic Henri	1880	F
Paris	Perey, Marguerite Catherine	1929 (Dipl.)	Fr
Paris	Urbain, Georges	1899	Lu
Paris	Vauquelin, Louis Nicolas	1780's	Be, Cr
Pavia	Sniadecki, Jędrzej Andrzej	1793 (MD)	Ru
Princeton	McMillan, Edwin Mattison	1932	Np
Purdue	Walton, John Richard	1957	No
Rheims	Brandt, Georg	1726 (MD)	Co
Rome	Segré, Emilio Gino	1928	Tc, At
Roy.Coll. Chem.	Crookes, Sir William	1854	Th
Sorbonne	Curie, Marie (Manya née Sklodowska)	1902	Po, Ra
Sorbonne	Curie, Pierre	1895	Ra
Sorbonne	Debiérne, André Louis		Ac
Stockholm	Arfvedson, Johann August	1800s (no deg.)	Li
Stockholm	Hisinger, Wilhelm, Baron von	no deg.	Ce
Texas	<b>Choppin, Gregory Robert</b>	1953	Es, Fm, Md
Transylvania	Müller, Franz Joseph von Reichenstein	no deg.	Te

TU Berlin	Noddack, Ida Eva Tacke	1920	Re
TU Munich	Armbruster, Peter	1961	Bh, Hs, Mt, Uun, Uuu, Uub
Tuebingen	Ramsay, Sir William	1873	He, Ne, Ar, Kr, Xe
UC Berkeley	Corson, Dale Raymond	1938	At
UC Berkeley	Ghiorso, Albert	1937(BSc)	Am, Cm, Bk, Cf, Es, Fm, Md, No, Lr, Sg
UC Berkeley	James, Ralph Arthur	1948	Cm
UC Berkeley	Kennedy, Joseph William	1939	Pu
UC Berkeley	Mackenzie, Kenneth Ross	1940	At
UC Berkeley	Morgan, Leon Owen	1947	Am
UC Berkeley	Seaborg, Glenn T.	1937	Am, Cm, Bk, Cf, Md, No, Pu
UC Berkeley	Street, Jr., Kenneth	1949	Cf
UC Berkeley	Thompson, Stanley Gerald	1948	Bk, Cf, Es, Fm, Md
UC Berkeley	Wahl, Arthur Charles	1942	Pu
UC Berkeley	Abelson, Philip Hauge	1939	Np
UC London	Travers, Morris William	1893 (BSc)	Xe, Ne, Kr
Uppsala	Berzelius, Jöns Jakob	1802 (MD)	Si, Se, Ce, Th
Uppsala	Cleve, Per Theodor	1863	Ho, Tm
Uppsala/ Mines	Cronstedt, Axel Frederik, Baron	1748(no Ph.D.)	Ni
Uppsala	Ekeberg, Anders Gustaf	1788	Ta
Uppsala	Gadolin, Johann	1780's	Y
Uppsala	Gahn, Johan Gottlieb	1770	Mn
Uppsala	Hjelm, Peter Jacob	1770's	Mo
Uppsala	Mosander, Carl Gustav	1825 (MD)	La, Er, Tb
Uppsala	Nilson, Lars Frederick	1866	Sc
Uppsala	Scheele, Carl Wilhelm	1770s	O, Cl
	Berg, Otto		Re
	Delafontaine, Marc		Ho
	Flerov, G.N.		Db, Rf

	Göhring, Otto H.		Pa
	Hofmann, S.		Dm, Z = 111, 112
	James, C.		Lu
	Larsh, Almon E.		Lr
	Latimer, Robert M.		Lr
	Münzenberg, Gottfried		Bh, Hs, Mt
	Perrier, Carlo		Tc
	Sikkeland, Torbjorn		No, Lr
	Zvara, I.I.		Rf

## PERIODIC TABLE OF THE ELEMENTS

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Uun	Uuu	Uub						

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
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Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
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## PERIODIC TABLE OF THE ELEMENTS (BY COUNTRY OF DISCOVERY)

													C					
															S			
							Fe			Cu	Zn							
										Ag			Sn	Sb				
									Pt	Au	Hg		Pb	Bi				


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### TIMELINE OF DISCOVERY OF ELEMENTS OF PERIODIC TABLE (ARRANGED BY YEAR OF DISCOVERY)

Year Discovered	Element Name	Element Symbol	Atomic Number, Z	Discoverers
ANTIQUITY	Carbon	C	6	ANTIQUITY
ANTIQUITY	Sulfur	S	16	ANTIQUITY
-5000	Copper	Cu	29	ANTIQUITY
-3000	Silver	Ag	47	ANTIQUITY
-3000	Gold	Au	79	ANTIQUITY
-2500	Iron	Fe	26	ANTIQUITY
-2100	Tin	Sn	50	ANTIQUITY
-1600	Antimony	Sb	51	ANTIQUITY
-1000	Mercury	Hg	80	ANTIQUITY
-1000	Lead	Pb	82	ANTIQUITY
1250	Arsenic	As	33	MAGNUS
1374	Zinc	Zn	30	UNKNOWN
1500	Bismuth	Bi	83	UNKNOWN
1669	Phosphorus	P	15	BRAND
1700	Platinum	Pt	78	ANTIQUITY
1735	Cobald	Co	27	BRANDT
1751	Nickel	Ni	28	CRONSTEDT
1755	Magnesium	Mg	12	BLACK
1766	Hydrogen	H	1	CAVENDISH
1772	Nitrogen	N	7	RUTHERFORD, D.
1774	Oxygen	O	8	SCHEELE
1774	Chlorine	Cl	17	SCHEELE
1774	Manganese	Mn	25	GAHN

1780	Chromium	Cr	24	KLAPROTH; VAUQUELIN
1781	Molybdenum	Mo	42	HJELM
1783	Tungsten	W	74	D'ELHUYAR
1789	Zirconium	Zr	40	KLAPROTH
1789	Uranium	U	92	KLAPROTH
1792	Titanium	Ti	22	KLAPROTH
1793	Strontium	Sr	38	KLAPROTH
1794	Yttrium	Y	39	GADOLIN
1797	Beryllium	Be	4	KLAPROTH; VAUQUELIN
1798	Tellurium	Te	52	KLAPROTH
1801	Vanadium	V	23	DEL RIO
1801	Niobium	Nb	41	HATCHETT
1802	Tantalum	Ta	73	EKEBERG
1803	Rhodium	Rh	45	WOLLASTON
1803	Palladium	Pd	46	WOLLASTON
1803	Cerium	Ce	58	KLAPROTH; BERZELIUS; HISINGER
1803	Osmium	Os	76	TENNANT
1803	Iridium	Ir	77	TENNANT
1807	Sodium	Na	11	DAVY
1807	Potassium	K	19	DAVY
1808	Boron	B	5	THENARD; GAY- LUSSAC
1808	Calcium	Ca	20	DAVY
1808	Ruthenium	Ru	44	SNIADECKI, OSANN, CLAUS (KLAUS)
1808	Barium	Ba	56	DAVY
1811	Iodine	I	53	COURTOIS
1815	Thorium	Th	90	BERZELIUS
1817	Lithium	Li	3	ARFVEDSON
1817	Selenium	Se	34	BERZELIUS
1817	Cadmium	Cd	48	STROMEYER; DAVY

1824	Silicon	Si	14	BERZELIUS
1825	Aluminum	Al	13	OERSTED
1826	Bromine	Br	35	LOWIG; BALARD
1839	Lanthanum	La	57	MOSANDER
1842	Erbium	Er	68	MOSANDER
1843	Terbium	Tb	65	MOSANDER
1860	Cesium	Cs	55	BUNSEN; KIRCHHOFF
1861	Rubidium	Rb	37	BUNSEN; KIRCHHOFF
1861	Thalium	Tl	81	CROOKES
1863	Indium	In	49	REICH; RICHTER
1875	Gallium	Ga	31	BOISBAUDRAN
1878	Holmium	Ho	67	CLEVE
1878	Ytterbium	Yb	70	MARIGNAC
1879	Scandium	Sc	21	NILSON
1879	Samarium	Sm	62	BOISBAUDRAN
1879	Thulium	Tm	69	CLEVE
1880	Gadolinium	Gd	64	MARIGNAC
1885	Praesodymium	Pr	59	VON AUER
1885	Neodymium	Nd	60	VON AUER
1886	Fluorine	F	9	MOISSAN
1886	Germanium	Ge	32	WINKLER
1886	Dysprosium	Dy	66	BOISBAUDRAN
1894	Argon	Ar	18	RAMSAY; TRAVERS
1895	Helium	He	2	RAMSAY; TRAVERS
1898	Neon	Ne	10	RAMSAY; TRAVERS
1898	Krypton	Kr	36	RAMSAY; TRAVERS
1898	Xenon	Xe	54	RAMSAY; TRAVERS
1898	Polonium	Po	84	CURIE, M.; CURIE, P.
1898	Radium	Ra	88	CURIE, M.; CURIE, P.
1899	Actinium	Ac	89	DEBIERNE
1900	Radon	Rn	86	DORN
1901	Europium	Eu	63	DEMARCA

1907	Lutetium	Lu	71	URBAIN
1917	Protactinium	Pa	91	SODDY; MEITNER; FAJAN
1923	Hafnium	Hf	72	COSTER
1925	Rhenium	Re	75	NODDACK, W.; NODDACK, I.
1939	Francium	Fr	87	PEREY
1940	Astatine	At	85	SEGRE; CORSON; MACKENZIE; SEGRE
1940	Neptunium	Np	93	ABELSON; MCMILLAN; SEABORG
1940	Plutonium	Pu	94	SEABORG
1943	Technetium	Tc	43	SEGRE
1944	Americium	Am	95	SEABORG
1944	Curium	Cm	96	SEABORG
1945	Promethium	Pm	61	CORYELL; MARINSKY
1949	Berkelium	Bk	97	SEABORG; THOMPSON
1950	Californium	Cf	98	SEABORG; THOMPSON
1952	Einsteinium	Es	99	CHOPPIN; THOMPSON
1952	Fermium	Fm	100	CHOPPIN; THOMPSON
1955	Mendelevium	Md	101	CHOPPIN; SEABORG; THOMPSON
1958	Nobelium	No	102	SEABORG
1961	Lawrencium	Lr	103	LAWRENCE
1964	Rutherfordium	Rf	104	VARIOUS RUSSIANS
1967	Dubnium	Db	105	VARIOUS RUSSIANS
1974	Seaborgium	Sg	106	GHIORSO
1981	Bohrium	Bh	107	GHIORSO
1982	Meitnerium	Mt	109	ARMBRUSTER; MUENZENBERG
1984	Hassium	Hs	108	GHIORSO
1994	Darmstadtium	Dm	110	ARMBRUSTER;



				HOFMAN
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### TIMELINE OF DISCOVERY OF ELEMENTS OF PERIODIC TABLE

